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ABSTRACT

A general introduction to cable television (CATV) in the metropolitan Denver area, with a focus on policy issues for local decision-making, is provided. The overview is based upon a literature review, information presented at conferences, local surveys of CATV, interviews with people involved with CATV, and on-going research conducted by the Denver Research Institute. A scenario describing a possible course of events associated with cable development in metro Denver serves to introduce policy questions. Following this, brief summaries give background information on cable and discuss major issues such as Federal regulation, ownership, cost, public access channels, minority access to CATV, impact on local programing, interconnection of cable systems, and cable franchising and ordinances. Three appendixes provide detailed information on Federal Regulations, on cable technology and applications, and on the status of cable development in the Denver area. (Author/LB)

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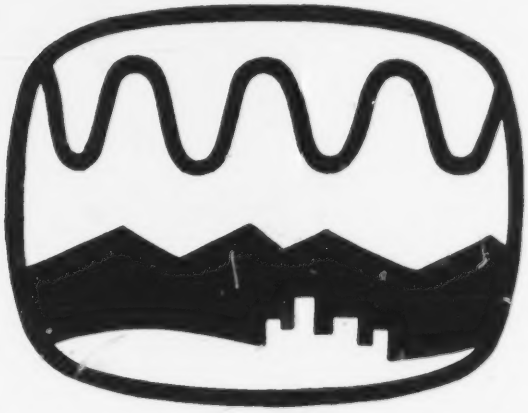

CABLE TELEVISION IN METRO DENVER

Background and Policy Issues For Local Decision-Making

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Denver Urban Observatory, February, 1973

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For Local Decision-Making

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INTRODUCTION

The purpose of this report is to provide a general introduction to cable television in the Denver metropolitan area. Its special focus is on policy issues for local decision-making in metro Denver.

The report is based on a review of cable television literature, information presented at several conferences on cable TV, a survey of the status of cable development in metro Denver, interviews with individuals representing different interests associated with cable TV development, and on-going research at the Denver Research Institute for the U.S. Department of Commerce and the Office of Telecommunications Policy. The Metro-Denver Conference on Cable TV Policy served as a valuable forum for initial discussion of many of the issues covered in this report.*

We have attempted to fairly define the issues and some of the alternative solutions available. More questions are raised than are answered. We have not attempted to describe the course that should be taken for cable development in the Denver area.

The format is designed to allow reading at several levels of detail. It was not our intent to duplicate the extensive literature on cable television. References throughout the report and a selected bibliography will lead the reader to detailed discussions on aspects of cable television that he may want to explore further.

A scenario describing a possible course of events associated with cable development in metro Denver is provided to introduce major local policy issues. The scenario is followed by a series of brief summaries providing background information on cable television in general and discussing major local policy issues associated with cable development. Appendices provide more detailed information on cable technology and applications, Federal regulations, and the status of cable development in the Denver area.

We thank the many people from community groups, government and industry who provided much of the information for the study. Final responsibility for the content of the report rests solely with the authors.

*The Metro-Denver Conference on Local Cable TV Policy was held in Denver October 13th and 14th, 1972. Co-sponsors were Denver Urban Observatory, Denver Regional Council of Governments, University of Denver Research Institute, Denver Community Video Center, Colorado Consortium of Higher Education, and City of Boulder.

A SCENARIO

CABLE AND DENVER – 1980

The scenario is an illustration of what might take place as cable television is developed in metro Denver. It is presented to introduce a number of the policy issues which are discussed in the following pages. It does not describe the only possible course of events, nor is it necessarily giving the "best" course.

DENVER AND CABLE–1980

1980 marks the first anniversary of Denver's metropolitan-wide cable network. While some of the suburban cities have had cable TV for as long as five years, Denver's system began operating only last year. At that time, the metropolitan network went into operation. Some areas of Denver still are not on the system.

Denver's viewers are provided with thirty channels of TV; in addition to Denver's five broadcast stations, there are two imported independent TV stations from Dallas and Kansas City, two pay TV channels, a channel for locally originated programming by the cable companies, special news channels, and a number of special purpose channels. Programming from all over the country is brought to the cable network by satellite.

Point-to-point video communication between schools and between public safety agencies is provided by the network. Local governments have channels which carry government activities. These channels also serve as part of a metro-wide governmental data network. The Denver Urban Service Authority has proposed that the government network come under its control.

Two-way cable TV, initially promoted to subscribers as one of the major advantages of the system, has developed quite slowly. The first innovative system, a home surveillance system providing fire and burglar alarm protection, went out of business only a year after it started. The service had been provided by a subsidiary of Denver's largest cable company. Now, a national firm which is providing surveillance services in cities across the country is trying again to market the new service.

Initial attempts to import a Juarez station to provide Spanish language programming met with objections from the Denver Chicano community. They claimed it was naive to assume that just any Spanish language station would provide proper programming for Denver's community, particularly since a large part of the Chicano population is not Spanish-speaking. A Chicano-controlled company now has its own leased channel, imports some programs and originates many of them from Denver.

The channel leased to a Black-owned corporation brings in programming from a national network of Black-owned stations. Major stations are in Washington, Chicago, New York and Los Angeles. The Denver corporation also is originating programs from Denver.

Denver's district attorney has said he will act to halt what he views as some obscene shows on the public access channel. However, the public access channel also has provided some of the most favorably received programming coming over the cable. Denver's two community video groups have had a major role in providing high-quality public access programming.

There still is talk of a municipally or community-owned cable system in Denver proper. A Common Cause ballot initiative for a municipally-owned system was narrowly defeated in 1975. A buyback clause in Denver's cable franchise allows the city to obtain

the system at any time the city desires a different form of ownership, and supporters of both municipal ownership and community-based ownership are still active.

The Boulder system, one of the first cable systems in the area, is finally showing a slight profit after five years of operation. Some residents have been complaining about high use fees for entertainment, claiming they are being forced to subsidize the large number of public service channels provided on the Boulder system. Residents claim that this subsidy is a form of hidden taxation.

Pay TV availability of Bronco, Rocket, and Spurs home games has reduced actual attendance at the games, but revenues to the teams from TV has more than replaced lost ticket sales. Police have been pleased with the reduced traffic loads at the games, and adequate parking space is more readily available for the arena/stadium complex.

Only one city in the area does not have cable. The city manager stated in 1973 that he wanted to "wait a while" to see further development of two-way cable services. Even though the successes and failures of two-way now are well-known, he believes his city should wait to see what happens with millimeter wave and optical fiber systems before making a committment. A citizen's committee, called Cable Now, is pressing for immediate issuance of a franchise.

The state legislature again is considering legislation to allow it to preempt local regulation of cable. California, Connecticut, Massachusetts and Wisconsin already have such legislation. Cable companies oppose this, citing state regulation as just an additional layer of red tape. Some cable companies have expressed the view that complete preemption of regulation by the Federal Communications Commission (FCC) would be preferable to fragmented local regulation.

The FCC, after a period of protecting cable from competition, is now considering the licensing of millimeter wave and optical fiber systems, which promise more carrying capacity at lower cost than cable. Some members of the FCC staff have indicated that it is time now to let the marketplace decide whether cable or the new systems can most efficiently provide broadband communication services. Cable companies claim that, in view of the large capital investment already made in cable, it would be wasteful to allow competition for urban broadband services.

This is not a forecast of what will happen, but a statement of what might happen. It is designed to illuminate some of the issues that will develop as cable comes to Denver, and to give another perspective from which the issues may be viewed.

CABLE TOPICS

A series of one and two page summaries of major topics affecting cable television development are presented. References are provided to more detailed discussions.

WHAT WILL CABLE TELEVISION BE LIKE IN DENVER?

Cable television is based on transmitting TV signals over a special kind of wire ("coaxial cable"), instead of sending signals over the air. Denver can expect twenty to thirty TV channels over cable initially—even more are technically possible. Many types of entertainment and services can be provided. Unanswered questions on what is transmitted over the cable are: (1) what do people want to see and (2) what are they willing to pay—in other words, what is economically viable? As noted in the following pages, different people have different answers to these questions.*

An outline of what can be expected in Denver over the next ten years follows:

- A cable network carrying twenty to thirty channels of TV will be built in the area, four to six times Denver's present TV channels. For a basic fee of $5-7/month, subscribers will receive Denver's five present broadcast channels, two imported signals (probably from Dallas and/or Kansas City, augmented by other imported stations when it is necessary to avoid duplicating local programming), a variety of news and sports channels, a public access channel available for use by anyone in the community, a channel for locally originated programming by the cable company, and possibly some special appeal channels, such as ones carrying Black and Chicano developed programming. Foreign language stations can be imported and a Spanish language station, such as from Juarez, might be provided over the cable. Other programming on the twenty to thirty channels will cover a wide range of cable applications.
- It is likely that pay TV channels will be available. Charges for watching these channels will be in addition to the basic monthly fee. Sports, movies and cultural events will be offered over pay TV channels.
- Some public service special channels (e.g., for schools, hospitals, public safety agencies and local government) will be on the cable system. Only certain subscribers will have access to them.
- A wide variety of other channels are possible. Referred to as the "blue sky" view of cable by some, and "the heart of the system" by others, social services, burglar and fire alarms, traffic control and a variety of educational systems could be provided. (See Appendix A for a list of thirty possible services.) Two-way communication from subscriber to other points on the system is possible technically. Whether or not such applications do come into the system involves questions of market demand, cost and public policy.

Historically cable TV has provided service in areas with poor TV reception due to natural barriers such as mountains, and man-made barriers such as the "concrete canyons" in big cities. Also small towns, without access to TV, or to only a few channels, have been good markets for bringing in distant signals. None of these circumstances exist here. Therefore, cable TV in Denver and other large areas is in some

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*Cable television technology and its applications, now and potential, are discussed in Appendix A.

ways a wholly new business. If people subscribe to a cable system in the Denver area, it will be for reasons completely different than those at the heart of cable TV's prior success.

In the following pages, a number of issues are discussed that will affect the success and the nature of cable development in Denver. The way in which these issues are resolved will have a major effect on "what will cable television be like in Denver?"

References: See Appendix A for a summary of cable technology and applications, now and in the future. Also see references 27, 30, 34 and 39 in Appendix C, Bibliography.

DIMENSIONS OF CABLE AS A BUSINESS

Cable television is a capital-intensive business. It is experiencing rapid growth in subscriber revenues, and if development of cable in urban areas proceeds successfully, this growth will accelerate. Revenues exceeding $1 billion per year are forecasted for the early 1980's. Profitability of cable in areas such as Denver is uncertain, because the economic viability of cable systems in large urban areas is as yet unproven. Most profit projections, however, are favorable.

Cable industry gross revenues in the United States were estimated to be $190 million in 1968. By 1971, revenues had almost doubled to $340 million. Annual revenue projections for the 1980's generally exceed $1 billion.

Cable television requires sizeable amounts of capital. Investment in physical plant, estimated at $1 billion in 1971 is projected to rise to $2.6 billion nationally by 1975 and to $7.8 billion by 1980.

Physical plant cost estimates of $20-25 million have been cited for Denver proper, and approximately an equal amount will be required for the surrounding suburban metropolitan area. Revenues will depend on the percentage of households subscribing to a cable system. With a basic charge of $6 per month, annual subscriber revenues in the City and County of Denver will yield $1.4 million annually for each 10 percent of penetration of total Denver households (e.g., 30 percent penetration yields revenues of 3 X $1.4 million = $4.2 million). These revenues could be supplemented by pay TV, advertising revenues and fees for special services such as burglar and fire alarm protection, and leasing of channels for commercial and government use.

Major capital plant investment is not much less for 25 percent market penetration than for higher penetration. Therefore, profitability is very dependent on the level of penetration and it is this penetration of the market that is the greatest uncertainty for cable in urban areas.

Overall national average penetration for cable systems is approximately 50 percent in areas served. No system of any significant size has achieved more than a 70 percent penetration. Projections for an area like Denver fall within the 25 percent to 50 percent range. Pick your penetration and you pick your profitability.

Interest in systems for large areas is based on: (1) experience in small markets where penetration was achieved primarily by providing a full complement of broadcast TV and better picture quality; and (2) estimates of revenue that might come from urban areas, new markets in which high penetration will depend on new services. Should a few spectacular failures of urban cable systems develop, investment money might be hard to find. Rapid decline has been a familiar fate for some "glamour industries."

Summing up, cable systems in urban areas are not certain money makers, but interest in the investment community is an indicator that probability of financial success is considered high.

References: See references 4, 13, 20, 22 and 33 in Appendix C.

FEDERAL REGULATION

Federal Communications Commission (FCC) rules and regulations on cable TV issued in 1972 will determine the general nature of cable TV in Denver. Among the areas covered in these rules and regulations are what stations must be carried, channel capacity, the provision of access channels for public and government use (and charges for them), technical performance standards, and franchise fees to local jurisdictions.

The Federal Communications Commission first asserted jurisdiction over cable TV in 1962, limited to stations using microwave to import signals. In 1966, rules were issued for all cable TV systems. In 1968, the Supreme Court found that the Commission's "regulatory authority over [cable TV] is imperative if it is to perform with appropriate effectiveness certain of its responsibilities," primarily those responsibilities concerned with broadcast TV. To allow major revision of cable rules, a virtual freeze on cable development in the top 100 markets was instituted in 1968.

Effective in March 31, 1972 the new FCC rules and regulations were issued. Some major points applying to the Denver area are:

- Cable systems must carry Denver's five broadcast channels (three network, one independent, one educational station).
- They may import two additional independent stations from the nearest two top twenty-five markets (Dallas or Kansas City).
- Foreign language stations may be imported.
- Capacity of at least twenty channels must be provided.
- At least one channel must be dedicated for each of the following: public access (anyone can use within certain restrictions), education, and government. Public access is to be provided on a non-discriminatory first-come, first-served basis, with usage charges only if use exceeds five minutes of live production facilities. There are to be no charges for the first five years for the educational or government channels.
- Two-way non-voice return capacity must be provided.
- Other items covered in the rules and regulations include ownership, program exclusivity, channel expansion, and leasing of channels.

Although well over one hundred pages of FCC rules and regulations have been issued, many items are left for local decision—a dual Federal-local jurisdictional division. Provisions for franchise exclusivity and duration, subscriber charges and special purpose networks are among issues left to local decision.

Questions regarding Federal, local and state regulation and the possible future evolution of regulatory responsibilities are discussed in the following topic summary.

References: See Appendix B for summary of Federal regulations. Also references 23, 40, and 41 in Appendix C.

FEDERAL-STATE-CITY REGULATORY RELATIONSHIPS

The Federal Communications Commission now dominates the regulation of cable systems. However, the roles of the cities and states will probably evolve toward greater regulatory responsibilities.

The regulatory relationship is presently dominated by the Federal Communications Commission (FCC). The FCC is in its first or protective phase of regulation with the cable companies,* helping them become established in the 100 major U.S. markets. To furnish such protection, it has largely pre-empted the regulatory field.

Thus, the states generally have little well-defined role in regulating cable; the State of Colorado has none. The FCC leaves municipalities free to bargain over franchise fees (within limits), user charges, rights-of-way, and detailed arrangements for using the public service channels.

This relationship may change.

The FCC will doubtless continue to set standards for service and, to some extent, for franchising. However, it may move away from detailed review of franchises. The New Federalism policy of the Administration argues against centralized regulation of essentially regional or local matters; in any case, the FCC eventually will de-emphasize its present protective role with the cable industry.

As cable systems develop the capacity for more varied functions such as surveillance and credit checking, they will become more involved with services that are already under the jurisdiction of state regulatory agencies or state courts. It seems possible that full use of cable systems' potential will bring the industry under state common carrier regulation; failure to make the full potential available to interested customers may involve restraint of trade. Furthermore, the coordination of different cable systems operating in metropolitan areas may require state intervention. Regional television authorities, such as those already under discussion in Connecticut, might also serve this coordinating function.

As the municipalities generate experience with supervising cable franchises, they may undertake more active regulation of the quality and variety of cable services. On the other hand, they may find rate regulations and competitive problems too complex to deal with, and may need state or region support.

The cable companies may not welcome these changing roles. They generally do not want state regulation. They are not averse to the present Federal pre-emption, particularly in its protective phase or mode.

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*The FCC historically has gone through three distinct phases of tele-communications regulation: first, protecting a new telecommunications industry; second, introducing a competing telecommunications industry (sometimes technologically more advanced); and third, encouraging the competitor.

In summary, the regulatory roles will probably evolve from their present relationship, but the evolutionary process may not be a smooth one.

References: See reference 3 in Appendix C.

WHAT IS THE COST OF A CABLE CHANNEL?

The actual cost of individual channels provided on cable TV systems is inherently difficult to determine. Many cost accounting questions arise. With a large investment in common plant use for many channels, should the costs per channel be fully and equally allocated across channels? Should costs for some channels be only the incremental (added) cost of providing those channels? What about "free" access channels—who pays for them?

The cost of a cable system is not a direct function of the number of channels. Cost tends to go up in a step-wise fashion. If a system can provide either twenty channels or twenty-four channels with basically the same cable configuration, the increased cost of providing the additional four channels is not very much. If, however, a few added channels require major system modification, such as an added cable, the additional costs could be very high.

In setting the fees for use of cable channels, assumptions must be made on cost allocation per channel. There is no single answer on what cost is associated with a channel because of the sharing of common plant. Fully allocated costs and incremental costs are two basic forms of cost allocation.

Fully allocated costing, in its simplest form, takes total system costs and divides them equally or in some specified proportion among the channels.

Incremental costing assumes that the basic physical plant cost can be allocated to commercial (entertainment) channels. Special channels (e.g., leased channels, public access channels other than the one required by the FCC) then must bear only the added expense directly incurred as a result of providing those channels. If the number of such channels is not large, the incremental cost is usually quite low.

Costing below incremental cost may occur for two reasons:

1. Channels or channel time could be provided at little or no cost to special groups such as racial and ethnic minorities or cultural groups, if it will increase market penetration. Although these special channels may generate little revenue directly, increased revenues for basic service may more than offset any losses on the special channels. Regulatory intervention on the basis of discriminatory pricing may prevent such cost procedures.
2. Regulatory and legislative action sometimes requires provision of channels at below incremental cost, even though there is no offsetting increase in market penetration. For example, present FCC rules require no charge for a government channel for at least five years. In this situation, other cable users may be subsidizing such a channel unless the operator chooses to accept reduced profits. Generally, an operator will hope to earn some specific level of return on investment, and such costs will be factored into his overall rate structure.

Cost allocation may become a major regulatory problem. For example, because cable systems can lease lines for such uses as credit checking, they will be competing with the telephone company which now leases lines for this purpose. It probably can be expected that disputes on fairly pricing such services between competing telecommunications media will center on cost allocation methods.

References: See references 4, 20, and 23 in Appendix C.

CABLE OWNERSHIP

Ownership by for-profit corporations, municipal ownership and non-profit community-based ownership are among alternative forms proposed for cable systems. Cable systems today overwhelmingly are owned by for-profit corporations, with large multiple system operators (MSO's) growing in importance.

Approximately 2,800 cable systems were in operation at the end of 1971. At first glance, this appears to be a highly fragmented industry. However, as of mid-1972, the top twenty-five MSO's served fifty-nine percent of all subscribers. Consolidation within the industry is continuing, although the U.S. Department of Justice's recent intervention in proposed mergers may result in imposition of new limits on consolidation.

Alternatives to for-profit corporate ownership are often discussed, but presently less than 2 percent of the systems are subscriber or municipally owned. (Reference 23)

Arguments favoring for-profit ownership include views of the cable industry as:

- A business requiring large amounts of investment capital, with a fair amount of risk.
- A business in which substantial entrepreneurial initiative will be required to develop a market for cable in urban areas.
- A business that is competing with other for-profit delivery systems (broadcast TV, telephone companies, newspapers) for a share of the communications market.
- A business dependent on high technology requiring skilled management that might best be provided by MSO's.
- A major means of public communication which traditionally in this country has not been government-controlled.

Advocates of municipally-owned systems see the cable industry quite differently.

- Cable will be successful in urban areas. Therefore, cities will not be risking public funds on an uncertain venture. Program packages of great appeal, such as sports, will be developed by entrepreneurs and available to a municipal system, as well as to large MSO's.
- The diversity of what is carried on the cable, from entertainment to public service to leased lines for business, educational and government use, make cable a utility, eventually a necessity for orderly city functioning.
- A municipally-owned system, with its access to relatively low-cost capital, can combine low-cost service with greater responsiveness to social needs that might be served by cable.
- "Profits" of the system, if any, remain in the community, to be used for increasing public services on the system or simply for income to the city's general fund.

- Management expertise can be obtained from specialized management firms, similar to what was done with Denver's bus system. Therefore, MSO's are not the only way to get good management.

For cities who proceed with for-profit ownership, a buy-back provision in the franchise would allow reconsideration of ownership options after the prospects of cable in urban areas b come less speculation and more fact. Such a provision, however, would have to be sufficiently reasonable to attract initial high-risk capital to the enterprise.

Only eighteen systems currently are municipally-owned, and most of these are in small cities. (Reference 23) However, Palc Aito, California, and several other cities are seriously considering municipal ownership.

A closely-related form to municipal control is ownership by a non-profit community-based corporation. Advocates of this position maintain that city government is not especially suited to cable ownership, and that a more responsive structure would incorporate direct representation from various community groups. Many variations have been discussed. Minority groups, cultural institutions, and local health, education, and social work groups might be involved, as well as municipal officials. At present, there are only thirty-five community-owned systems, and these are subscriber-owned, mostly in small towns where private capital was not available (Reference 23).

There are hybrid forms of ownership, too. In Dayton, Ohio, a proposal has been made where a consortium of a minority group concern and a multiple system operator (MSO) would share ownership. The minority owners would have control of and revenues from the cable system in the part of the city with predominantly minority group population. The MSO would receive the balance of the franchise in exchange for financial and technical support of the minority group's system. (See "Minority Access and Control" topic for discussion of minority group ownership.)

References: See references 27, 35, 36, and 37 in Appendix C.

PUBLIC ACCESS CHANNELS

Federal Communications Commission regulations call for at least one public access channel available without charge at all times on a first-come, first-served non-discriminatory basis. Additional channels can be called for by local ordinances. Community video groups are being formed to assist in providing public access programming.

Use of the public access channel required by the FCC must be provided free of charge. Production costs may be charged to users, except for live studio presentations not exceeding five minutes in length.

Why is a public access channel required? The FCC statement is "We believe there is increasing need for channels for community expression. . . The public access channel will offer a practical opportunity to participate in community dialogue through a mass medium."

Much of what will come over the public access channel probably will be a video version of radio talk shows. Undoubtedly, questions of taste, if not libel or obscenity, will from time to time bring complaints from viewers. This has been the experience in New York, which has two public acess channels.

A far brighter vision of public access is held by community video groups. Denver's Community Video Center hopes to develop production facilities for use by groups and individuals in the Denver area. By providing the equipment and expertise to help produce good community programming, they believe that public access programming will provide an effective new channel for community dialogue and cultural development.

Although only one public access channel is required by the FCC, others can be provided in a cable ordinance. Rather than making these additional channels available to everyone, it is possible that they may be dedicated, leased channels to particular groups. For example, dedicated channels might be provided for minority communities (see the topic "Minority Access and Control" in this section), or cultural groups. Regulatory aspects of leasing such channels at token cost are uncertain at this time.

Should a large number of dedicated channels for public use be made available at low cost? (See the topic "What is the Cost of a Cable Channel?) Public access programming is a new area. A franchise should have the flexibility to accomodate public access growth, if its use and community interest in its programming warrant. It should not rigidly commit large chunks of system capacity before demand has been determined. However, the franchise should specifically describe the equipment, personnel, and operating procedures to be used initially for public access.

References: See references 6, 9, 15, and 37 in Appendix C.

MINORITY ACCESS AND CONTROL

The number of channels provided by cable systems provides the opportunity for more diverse programming than broadcast TV. Chicano and Black groups in Denver plan to obtain significant access to the cable system and to have an important role in the development of this new communications medium.

Minority group interest in cable focuses on access, programming and financial participation. The public access channel required by the FCC is well-suited for presentation of a kaleidoscopic variety of opinions and programming from many elements of a community. It does not provide the continuity and focus for a single group that a dedicated channel can provide.

In 1970, Spanish-surnamed population comprised 16.8 percent of the City and County of Denver's population and 11.3 percent of the metropolitan area population. Black population in 1970 was 9.1 percent of Denver's population and 4.1 percent of the metropolitan area population. Another 0.5 percent of Denver's population is Indian. The total 1970 population of these three minority groups in metro Denver was more than 190,000. They, therefore, are a major part of Denver's potential cable market.

The Colorado Committee on Mass Media and the Spanish Surnamed, Inc. has been considering the role of Chicanos in Denver cable development. A related group, Raza Communications, is being organized specifically for cable-related activities and plans an active role in development of cable TV in the metropolitan area.

The Denver Urban League has been studying the role of Blacks in Denver cable. Other individuals and groups in the Black community are actively planning for the coming of cable.

The Denver office of the Community Relations Service, U.S. Department of Justice, has been assisting minority groups and others in learning about cable TV and its implications for their communities.

There are several courses of action being considered by these groups. Major options are:

- Provision in cable franchises for dedicated channels, provided at little or no cost, for use by the Black and Chicano communities. There probably would be locally-originated programming, and importation of programming from minority controlled channels in other cities. An agreement has been reached which would provide channels to minority groups at $1 per year in several California cities. American Television and Communications Corp., Cox Cable Communications, Inc. and several non-profit minority groups announced the agreement in November, 1972.
- Direct financial participation in the cable system, either by community ownership or by participation in a consortium with a cable operator. Consortiums are being considered by several cities. The proposed Dayton, Ohio, consortium involving Cypress Communications and Citizens Cable, a Black-owned corporation, is a good example of such an approach.

Simple access to a channel doesn't provide much to the user without funds or expertise to develop good programming. The Denver groups concerned with minority access probably will want provisions of such support included in any franchise.

Employment in general cable operations (in addition to employment resulting from special channels) also has been expressed as an item of concern. Federal regulation calls for equal opportunity employment, but some minority spokesmen believe more specific definition should be provided in ordinances and franchises.

Cable companies probably would be willing to provide some of what the minority groups are seeking. Forming approximately one quarter of Denver's population (and nearly one-sixth of the metro area population), the minority groups are potent political forces. Also, the programming they seek to provide may significantly aid market penetration. Therefore, to some degree, the interests of minority groups and cable companies are coincident. They diverge most sharply when ownership options are being discussed.

References: See references 36 (on the Dayton example) and 37, Appendix C.

IMPACT ON LOCAL BROADCASTING

Cable television can have a negative impact on broadcast television. The FCC rules were designed to minimize this impact while encouraging cable development in urban areas.

When cable television imports distant signals or introduces pay TV programming, it fragments the local audience for TV entertainment programming. Fragmentation tends to reduce broadcast station revenue. Because experience with cable TV in markets similar to Denver is virtually non-existent, impact estimates are speculative.

In a 1970 study by the Rand Corporation (Reference 32), a model was developed that shows decreases in broadcast station revenues due to cable. However, the model assumed a more attractive set of imported signals than the 1972 FCC regulations allow. Also, the revenue decrease in markets like Denver was not estimated to be as severe as in smaller markets.

Some decrease in revenues of broadcast TV can be expected from cable. The protective nature of some of the FCC rulings for broadcast TV, coupled with the virtual certainty that the cable companies will have to pay copyright fees to the broadcasters, seems to indicate that the financial impact on broadcasters will not be severe. Because cable will be importing two additional independent stations, Denver's independent station may be impacted most.

Pay TV introduces another uncertainty. Successful pay TV operations have the potential of generating much more revenue than advertising, the broadcaster's source of revenue. If this is the case, it may be that broadcasters will often be outbid for good programming. This could then accelerate the shift of viewers from broadcast to pay TV channels.

The Rand study found that the quantity and quality of local and public service programming increases as station revenues increase. On that basis, it appears that the potential decrease in broadcast revenues could bring about a decrease in local and public service broadcast programming. The FCC, however, believes its cable rules give sufficient protection to broadcasters, and that broadcast service will not be degraded.

References: See references 32 and 40, Appendix C.

STATUS OF CABLE DEVELOPMENT IN METRO DENVER

A number of cities and counties (eighteen) in the metro area have franchises. For most of these (fifteen), applications for certificates of compliance with the new FCC regulations have been filed. The majority of the metro area population, however, is not covered by existing franchises. Status in cities not having franchises range from review of applicants' bids (Lakewood, Boulder) to low-key review of possible options in Denver and other cities.*

A survey was conducted to determine the current status of cable system development in metro Denver. A summary of survey results is presented in this section.

Fifteen franchises in the suburban metropolitan area are held by Mountain States Video (MSV), which is owned 51 percent by Cablecom-General and 49 percent by Mountain States Video, Inc. (Bill Daniels and associates). Applications for certificates of compliance, if granted by the FCC, will in effect update these franchises (issued mostly in 1967 and 1968) to meet new FCC requirements.

Two other franchises, for Longmont and parts of Boulder County, are held by Longmont Video, Inc., a company with similar ownership interests as Mountain States Video. However, no applications for certificates of compliance have been filed for these. It is possible that the Boulder County franchise may be withdrawn by the county.

The Mountain States Video franchises generally call for start of construction promptly after FCC certification. Another clause in many franchises delays construction until "the necessary microwave facilities have been completed." New FCC rules and regulations are more specific. Franchisees are required to accomplish "significant construction within one (1) year after receiving Commission certification."

Lakewood and Boulder are reviewing applications for franchises. Their ordinances, drawn up in 1972, reflect the increased city concern that has developed in the last year over the nature of cable franchises. Each city has received two bids. Lakewood's applicants are Community Tele-Communications, Inc. (part of Denver-based Tele-Communications, Inc.) and Mountain States Video. Boulder's applicants are Teleprompter, a New York-based corporation, and Community Tele-Communications, Inc.

Considering Cablecom-General's majority ownership of Mountain States Video, all franchises and current franchise applicants in metro Denver are large multiple systems operators (MSO's). As of September, 1972, Teleprompter was number one in the country in terms of subscribers, Tele-Communications, Inc. number four, and Cablecom-General number seven.

Major communities in the area having no franchise and not currently seeking one are Denver, Littleton (formerly had a franchise with MSV which expired), Northglenn,

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*In this report, the term franchise is used for franchises and permits.

Thornton, and Wheatridge. Also the unincorporated areas of Adams and Arapahoe County have no current franchises. A number of the smaller towns in the area don't have franchises and probably will not develop cable systems until development has started in the larger areas.

It appears that construction of cable systems in the suburban metro area will begin and accelerate over the next two to three years. The pace of construction probably will be affected by the City and County of Denver's decisions concerning if and when to develop a cable system. In our judgment, a majority of homes in the metro Denver area will not have access to cable service before 1978 or 1980.

References: See Appendix D and reference 6, Appendix C.

INTERCONNECTION OF CABLE SYSTEMS

The metro Denver area will have a number of separate systems. Interconnection of systems for certain channels will occur without specific franchise requirements. However, specific ordinance and franchise provisions will be required to assure interconnection of all channels for which this is desired. Some form of regional or state coordination might be required.

Interconnection among systems in the metropolitan area for certain channels can be expected to develop without specific franchise provisions. Imported distant television signals, such as from Dallas or Los Angeles, will be brought to Denver by microwave transmission. The cost of importing these signals is high, and cable companies in the area most likely will want to share the microwave costs.

Capital costs for interconnection vary, depending on the distance between system headends (the cable system's signal origination point). For systems that are very close together, cable might be used for the interconnections and cost would not be particularly sensitive to the number of channels interconnected. For longer distances, such as from Denver to Boulder or Brighton, microwave links would probably be used, and capital cost would be more a function of the number of channels involved.

It is important to identify the number of channels for which interconnection is desired. Overspecifying interconnection, such as requiring certain leased or access channels to be interconnected, would be wasteful.

Little thought seems to have been given to interconnection by local governments in the area at present. No mechanism exists for local communities to get together on this question to coordinate specifications in their franchise. The Denver Regional Council of Governments is one organization that might serve as the coordinating agency for interconnection problems in metro Denver.

References: See reference 24, Appendix C.

CABLE ORDINANCES AND FRANCHISES

Resolution of most local policy issues ultimately is formalized in an ordinance which governs cable locally. A major problem in preparing an ordinance and franchise or permit is the need to be specific enough to have an enforceable set of rules understood by all parties, and yet to retain the flexibility needed for change as experience is gained from system operation.

The FCC rules and regulations call for ". . .a deliberately structured dualism. . ." of cable regulation, ". . .because local authorities are able to bring a special expertness to [certain] matters. . .". Before a cable system begins operation, however, it must obtain a certificate of compliance from the FCC with respect to certain minimum standards. The standards "relate to such matters as the franchise selection process, construction deadlines, duration of the franchise, rates, and rate changes, the handling of service complaints, and the reasonableness of franchise fees."

Model ordinances are available to use as guides. The League of California Cities and the Urban Institute's Cable Television Information Center each have published such ordinances. In the Denver area, Lakewood's ordinance has received praise from many sources. Boulder's ordinance is being revised and will be available in the spring, 1973.

Based on the Cable Television Information Center model ordinance, major subject areas to be covered in an ordinance include:

- Provisions governing the length, renewal and transfer of a certificate or franchise.
- A recapture or buyback provision.
- Definition of the franchise territory, provisions for extension of service throughout the community, timetables for construction and provision of service, and for maintenance and alteration of the system after construction.
- System design, including specification of items such as channel capacity and uses, interconnection and specialized services.
- Technical performance standards, including equipment details, signal quality, and performance testing.
- Public access facilities and operating plans.
- Rates, including standard subscriber rates, connection fees, subscriber rate subsidies for special groups, if any, and provisions for review and revision of rates.
- Franchise fees (fees in excess of 3 percent of gross subscriber revenues require special FCC approval although a "reasonable" range of 3 to 5 percent is stated in the FCC rules and regulations).
- Employment requirements, including development by the cable operator of an effective equal employment opportunity program.
- Provisions for handling consumer complaints.
- Procedure for awarding a franchise or permit.

- Other topics such as procedures for resolving disputes, record and reporting requirements, sanctions and penalties, and liability.

It is not difficult to develop a comprehensive ordinance and franchise. What is difficult is to retain the flexibility needed, in view of the lack of experience with cable systems in urban areas.

References: See references 23, 25 and 26, Appendix C.

A SUGGESTED PROCEDURE

A procedure is suggested for use by the City and County of Denver in developing a new ordinance governing cable television. Parts of the procedure may be applicable to other cities in developing an ordinance or modifying an existing ordinance.

In developing a cable television ordinance, we recommend that the present City Council cable committee of four be augmented by two representatives of the city's executive branch. This expanded committee then would direct city efforts to develop an ordinance.

Many cities, such as Lakewood, have used citizens' cable advisory committees in one form or another. We do not recommend such a committee for Denver. If membership is small enough for effective functioning, some interests in a city as large and diverse as Denver undoubtedly will not consider themselves to be properly represented.

As an alternative to a citizens' committee, the city cable committee should hold a series of public hearings on cable TV in Denver before drafting an ordinance. These hearings should be well-publicized, well in advance, using newspaper, radio and TV. The committee should take the initiative to make factual information on cable television broadly available before the hearings.

The hearings should be topic oriented. For example, one hearing might be devoted to cable ownership, another one to public access, etc.

In this way, all people in the community who believe they have an interest in cable development will be given an opportunity to be heard before an ordinance is drafted. The key to success of this approach is extensively publicizing the hearings well in advance to allow groups to thoroughly prepare thier comments.

After the hearings, the cable committee, supported by city staff and outside consultants where required, should draft an ordinance. General meetings of the committee while drafting the ordinance should be open to the public. A draft ordinance should be made available to the public for review and comment.

This suggested procedure is not the fastest and easiest way to develop an ordinance. It is a procedure that will make cable TV in Denver an issue of extensive public discussion. There seems to be no great need to draft an ordinance in a short period of time; ample time can be and should be allowed for the process.

References: See reference 23, Appendix C.

APPENDIX A
CABLE TV TECHNOLOGY AND APPLICATIONS

APPENDIX A

CABLE TV TECHNOLOGY AND APPLICATIONS

Background

Definition of Telecommunications

Telecommunications is a way of electrically transmitting information in the form of pictures, sound or data. At the originating source the information is coded on an electromagnetic wave, which is then transmitted over a network, such as a telephone network, or through space, and finally received and decoded by a receiving device, such as a radio, telephone, or television set.

What forms of telecommunications are there?

Common forms of telecommunications include television, AM and FM radio, telephone, telegraph, and microwave systems.

Broadcasting.

Television signals generally are "cast broadly" across a given geographic area. That is, television signals are broadcasted or transmitted through the air in all directions. Broadcast signals are susceptible to interference while traveling through the air from other electric fields, whether they be signals from other radio sources or stray electric fields such as from the ignition system of an automobile.

Limitations of Broadcasting.

The use by one broadcaster of an assigned range of frequencies for the transmitted wave, which we call a channel, generally precludes its use by anyone else in a given area. Because of this, there are problems of allocating the range of frequencies available (the frequency space). Scarcity of frequency space results when the demand of users seeking to broadcast exceeds the supply of frequency space, a common situation in large metropolitan areas. Large users of frequency space include TV and radio broadcast, aviation, police and fire telecommunications systems, private mobile users such as taxicab and trucking firms, government (military and civilian) and amateur (ham) radio. In Denver today, police channels in the VHF (very high frequency) range are fully allocated, forcing expensive conversion to the sometimes less efficient UHF (ultra high frequency) range.

Information Carrying Capacity

Information carrying capacity of a telecommunications system can be defined by bandwidth, which is the amount of frequency space (in units of cycles/second) required to transmit a given amount of information per unit time. Typical bandwidths are:

Telegraphy	Less than 1000 cycles/second
Telephone	4000 cycles/second
AM Radio	10,000 cycles/second
FM Radio	150,000 cycles/second
Color TV	6,000,000 cycles/second

Television's Tremendous Use of Bandwidth

TV is by far the largest "consumer" of frequency space among these forms of telecommunications. A single television channel requires more than 1000 times the bandwidth of a telephone channel and 40 times the bandwidth of an FM radio channel. Many applications for television have been suggested, from televising public meetings (electronic town halls), to video shopping, to pay TV. Before such applications can come into widespread use, large amounts of bandwidth at relatively low cost must be available, requiring that bandwidth no longer be a scarce commodity.

Wired Networks

By sending signals over a wire network, the electric fields are essentially confined to the wire, allowing the use of a given part of the frequency spectrum by many users in one geographic area. That is why so many people can use a telephone network at the same time. If the number of subscribers increases, capacity can be increased by stringing more wire and installing more switching. A wired network is limited by the amount of available capital or physical plant, rather than the amount of available frequencies.

A-1

CABLE TELEVISION TECHNOLOGY

Coaxial Cable

Cable television systems are wired networks which use coaxial cable to carry the TV signal.

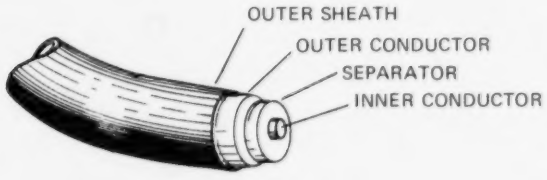

FIGURE 1 – COAXIAL CABLE

Instead of the common "wire pair," two wires side by side, the coaxial cable wires (the inner and outer conductors in the sketch) share the same axis. The advantage of coaxial cable is that it can carry signals over a wide range of frequencies (wide bandwidth) with a minimum of interference.

Cable Capacity

Cable bandwidths of up to 250 million cycles/second, equivalent to approximately 40 TV channels, are achievable today. For technical reasons this carrying capacity is generally limited in practice to twelve to twenty channels per cable. Given a maximum of seven VHF stations and several UHF stations possible in Denver, using broadcast TV, it is possible to increase the capacity for television signals manyfold using cable, particularly if multiple cables are employed.

Two-Way

In addition to its tremendous information carrying capacity, cable can provide two-way communications. Broadcast TV and almost all current cable systems deliver information from the station or cable "head-end" to the receiver (a "downstream" system). The only "two-way" response that is possible under this system is a phone call, letter, or personal visit from a listener to the station.

The Cost of Two-Way

Cable networks (Figure 2) can provide varied two-way capability. For example, a small keyboard, much like a Touchtone phone unit, can be placed in the home (or business) and signals can be sent by the subscriber "upstream" to the cable head-end or to selected other points on the cable network, such as a school or police station. The cost of accomplishing this is dependent on the extent of upstream capability. Upstream capability limited to simple electrical codes, representing 1, 2, 3,. . . and combinations of these (known as digital response) can cost as little as $100 more capital investment per subscriber. A two-way switched video system, connecting any subscriber to any other subscriber could cost as much as an additional $5,000 capital investment per subscriber.

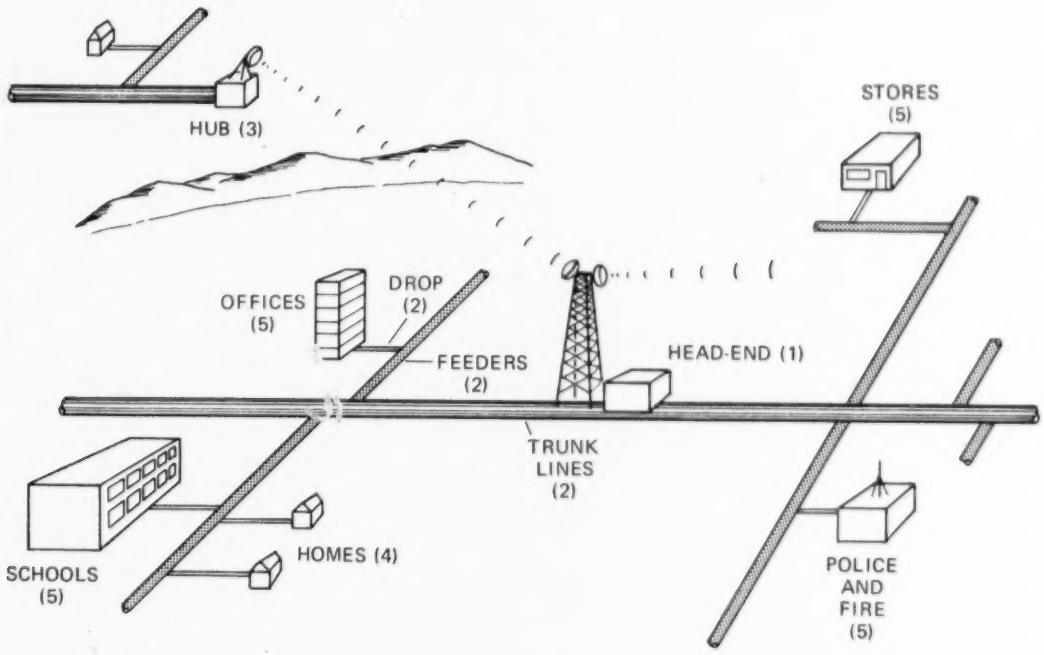

FIGURE 2 – CABLE NETWORK

1. At the station or "head-end" of the cable network, distant TV signals may be received and, with local broadcast signals, transmitted over the cable network to subscribers. Cable systems also may have the capability of originating programs.
2. The network typically consists of trunk and feeder cables with drop lines to the subscriber (a tree system).
3. For large networks, such as would be needed in Denver, signals can be sent from the head-end to hubs for distribution over a tree system cable network. Other system variations with switching capability to allow for two-way communication, also can be used.
4. Homes generally will receive entertainment. Also a number of special services in addition to traditional TV fare can be provided over the cable network.
5. Schools, offices, government agencies and commercial establishments can be provided with "point-to-point" service on the cable. For example, commercial establishments could be part of a credit verification network; schools could have a special educational network.

A Capital Limited System

As noted in the previous section, the carrying capacity of a cable system (downstream and upstream) is plant-limited, and therefore capital-limited. It is not frequency-space-limited. Under these circumstances, television becomes a communication resource of abundance, rather than scarcity, providing that sufficient revenue sources can be developed.

"Blue Sky" or Not?

Many potential applications have been suggested for cable networks beyond standard broadcast TV fare. These will be discussed in the following section. The key point is whether and how such applications can be financed. The only difference between "blue sky" and "practical," the debate that consumes so much space in the literature and so much time at cable conferences, is whether or not a given application can be developed into an economically viable service.

A-2

CABLE TELEVISION APPLICATIONS

Cable TV's Present Markets

Historically, cable TV has been used to pull in signals to small towns either unable to receive broadcast TV at all, or to receive it with poor picture quality. Colorado has many such cable systems. Towns with one or two stations of their own also have been good cable markets because cable could "import" distant signals from large cities, providing a full complement of network stations and possibly an independent and/or educational station. Another market has been in densely built areas, such as Manhattan, where large buildings make reception difficult. Two cable systems are now operating in Manhattan.

Conventional Cable Service

In sum, cable TV has provided: (1) a level of conventional TV service in small communities equivalent to that of large communities; and (2) improved picture quality to both small and very large communities. Because of the inherent large capacity of cable, some special programming such as continuous news and weather service, local high school football games, and town meetings, are provided on some cable systems, known as "local origination".

A Search for New Markets

Issuance of new FCC rules and regulations on cable TV in March, 1972 (Appendix B) has resulted in active promotion of cable in large metropolitan areas. Looking at the traditional services provided by cable, why would anyone want to put a CATV system in an area like Denver, with its five TV stations and a topography providing general good picture quality? This question brings us to new applications of cable.

Some Traditional Services

There is a limited market in our area for traditional cable services. Some areas do have signal problems because of terrain, such as Green Mountain and parts of Boulder. Importing distant signals of other stations in Dallas or Los Angeles might find an audience of modest size. This might amount to a more than modest audience for a sports event blacked-out, or just not televised in Denver. At costs of $4,000-$5,000 per mile for aboveground coaxial TV cable, and $10,000-$50,000 per mile for underground cabling, it is doubtful whether the limited markets just identified could justify installation of much more than a few "neighborhood" systems.

Some Cable Applications

A number of applications for cable systems have been proposed beyond broadcast TV signals and limited local programming. Among applications commonly mentioned are:

- Importation of independent station signals from other cities.
- Pay television for sports events, first run movies, or special interest, small audience subjects.
- Special point-to-point networks serving hospitals, government agencies, law enforcement and other social agencies.

- Commercial networks for credit checking and "cashless society" transactions.
- Home surveillance networks for burglar and fire alarms connected to a central alarm center, and other remote control functions such as meter reading.
- Video shopping, whereby using a two-way unit, a viewer may order goods displayed on the screen.
- "Town halls" using a two-way unit to obtain opinions and straw votes on issues.
- Educational TV providing course work with interactive capability through two-way units.
- A host of other services such as traffic control, data transmission and information retrieval of many forms.

The list of potential applications is staggering. Table 1 lists 30 forms of potential home information services via cable identified in an Institute for the Future study (Reference 21).

Some Qualifications

With such an array of potential services, what services can be expected to be provided? Three major points must be noted:

1. Technology is available to provide all of these services. The cost of providing them is uncertain, at present partly because cost of a single service will depend to some extent on the total array of services (due to shared use of the same facilities) and on the development of a large enough market to bring unit cost down to reasonable levels.
2. Some of the proposed services are new. Examples are pay TV, electronic town halls and video shopping. The viability of new services cannot be established without market testing and development.
3. Some of the proposed services are existing or in direct competition with existing services. Examples are data transmission where phone lines and microwave are now used, and facsimile transmission of news, where newspapers are now used. For such services to be successful cable would have to demonstrate a savings in cost and time, or provide more personal convenience or flexibility.

Therefore, the "blue sky" is not "blue sky" technically. What is unknown is the public and private market potential for establishing a viable service.

Two-Way Experiments

Several experiments are now testing the market for some of these services. Cities in which major tests of two-way systems are underway are Orlando, Florida; El Segundo, California; Irving, Texas; Overland Park, Kansas; and Jonathan, Minnesota. It will probably take 3-5 years before definite results can be expected. With new cable franchises being granted all over the country, we can expect many more such experiments. Over a period of years, with money made and money lost, the list of viable cable services will evolve.

TABLE 1

BRIEF DESCRIPTIONS OF POTENTIAL HOME INFORMATION SERVICES

1. CASHLESS-SOCIETY TRANSACTIONS. Recording of any financial transactions with a hard copy output to buyer and seller, a permanent record and updating of balance in computer memory.

2. DEDICATED NEWSPAPER. A set of pages with printed and graphic information, possibly including photographs, the organization of which has been predetermined by the user to suit his preferences.

3. COMPUTER-AIDED SCHOOL INSTRUCTION. At the very minimum, the computer determines the day's assignment for each pupil and, at the end of the day, receives the day's progress report. At its most complex, such a service would use a real-time, interactive video color display with voice input and output and an appropriate program suited to each pupil's progress and temperament.

4. SHOPPING TRANSACTIONS (STORE CATALOGS). Interactive programs, perhaps video-assisted, which describe or show goods at request of the buyer, advise him of the price, location, delivery time, etc.

5. PERSON-TO-PERSON (PAID WORK AT HOME). Switched video and facsimile service substituting for normal day's contacts of a middle-class managerial personnel where daily contacts are of mostly routine nature. May also apply to contacts with the public of the receptionist, doctor, or his assistant.

6. PLAYS AND MOVIES FROM A VIDEO LIBRARY. Selection of all plays and movies. Color and good sound are required.

7. COMPUTER TUTOR. From a library of self-help programs available, a computer, in an interactive mode, will coach the pupil (typically adult) in the chosen subject.

8. MESSAGE RECORDING. Probably of currently available type but may include video memory (a patient showing doctor the rash he has developed).

9. SECRETARIAL ASSISTANCE. Written or dictated letters can be typed by a remotely situated secretary.

10. HOUSEHOLD MAIL AND MESSAGES. Letters and notes transmitted directly to or from the house by means of home facsimile machines.

11. MASS MAIL AND DIRECT ADVERTISING MAIL. Higher output, larger-sized pages, color output may be necessary to attract the attention of the recipient—otherwise similar to item 10 above.

12. ANSWERING SERVICES. Stored incoming messages or notes whom to call—possibly computer logic recognizing emergency situation and diverting the call.

13. GROCERY PRICE LIST, INFORMATION, AND ORDERING. Grocery price list is used as an example of up-to-the-minute, updated information about perishable foodstuffs. Video color display may be needed to examine selected merchandise. Ordering follows.

14. ACCESS TO COMPANY FILES. Information in files is coded for security; regularly updated files are available with cross-references indicating the code where more detailed information is stored. Synthesis also may be available.

15. FARES AND TICKET RESERVATION. As provided by travel agencies now but more comprehensive and faster. Cheapest rates, information regarding the differences between carriers with respect to service, menus, etc. may be available.

TABLE 1 (CONT.)

BRIEF DESCRIPTIONS OF POTENTIAL HOME INFORMATION SERVICES (CONT.)

16. PAST AND FORTHCOMING EVENTS. Events, dates of events, and their brief description; short previews of future theater plays; and recordings of past events.

17. CORRESPONDENCE SCHOOL. Taped or live high school, university, and vocational courses available on request with an option to either audit or graduate. Course on TV, paper support on facsimile.

18. DAILY CALENDAR AND REMINDER ABOUT APPOINTMENTS. Prerecorded special appointments and regularly occurring appointments stored as a programmed reminder.

19. COMPUTER-ASSISTED MEETINGS. The computer participates as a partner in a meeting, answering questions of fact, deriving correlations, and extrapolating trends.

20. NEWSPAPER, ELECTRONIC, GENERAL. Daily newspaper, possibly printed during the night, available in time for breakfast. Special editions following major news breaks.

21. ADULT EVENING COURSES ON TV. Noninteractive, broadcast mode, live courses on TV–wider choice of subjects than at present.

22. BANKING SERVICES. Money orders, transfers, advice.

23. LEGAL INFORMATION. Directory of lawyers, computerized legal counseling giving precedents, rulings in similar cases, describing jurisdiction of various courts and changes of successful suits in a particular area of litigation.

24. SPECIAL SALES INFORMATION. Any sales within the distance specified by the user and for items specified by him will be "flashed" onto the home display unit.

25. CONSUMERS' ADVISORY SERVICE. Equivalent of *Consumer Reports*, giving best buy, products rated "acceptable", etc.

26. WEATHER BUREAU. Country-wide, regional forecasts or special forecasts (farmers, fishermen), hurricane and tornado warnings similar to current special forecast services.

27. BUS, TRAIN, AND AIR SCHEDULING. Centrally available information with one number to call.

28. RESTAURANTS. Following a query for a type of restaurant (Japanese, for instance), reservations, menu, prices are shown. Displays of dishes, location of tables, may be included.

29. LIBRARY ACCESS. After an interactive "browsing" with a "librarian computer" and a quotation for the cost of hard copu facsimile or a slow-scan video transmission, a book or a magazine is transmitted to the home.

30. INDEX, ALL SERVICES SERVED BY THE HOME TERMINAL. Includes prices of charges of the above, or available communications services.

Reference: This table is taken directly from: Baran, Paul. *Potential Market Demand for Two-Way Information Services to the Home, 1970-1990.* Menlo Park: Institute for the Future, 1972, p. 9.

A-3

NEW TECHNOLOGIES AND THEIR IMPACT ON CABLE TV

TV Innovations

A study of technological innovations in television that may occur over the next ten to twenty years (Reference 22) has recently been completed by DRI, under contract to the U.S. Department of Commerce. Some of the innovations identified in this study probably will be incorporated into cable systems within the next decade, thereby increasing the diversity of possible services. A few of these innovations are briefly described below.

Small Low-Cost Cameras

Television cameras. Solid state electronics is bringing about major reductions in camera cost coincident with easier operation and higher reliability. Costs for color cameras are coming down from present prices of more than $10,000 to prices as low as $2500 in 1973. Prices of $150 for a color camera for non-studio use have been cited as possible within ten years. It is reasonable to expect that this will widen the use of TV in community groups, business, and education. Its effect on cable will be to broaden program production capability and probably to increase demand for channel space.

Video recording and playback. A number of systems ranging from video-tape systems to systems using discs (much like an audio record disc), are now being introduced. Within 3-5 years, a few systems will probably dominate the market. Present costs of $1000 or more per unit will drop to $500-700 within a few years, and might go as low as $150 within five years. Video discs with an hour's programming will cost $5-10, not much more than audio record discs. Tape systems with record capability can be used in conjunction with cable and a computer allowing a viewer to order a program, record it and play it back at his leisure.

Satellites. There probably will be competing domestic communications satellite systems within a few years. Significant cost reduction for TV networking can be expected. One satellite proposal estimated that present network communications costs of $70 million/year can be reduced to $28 million/year by use of satellites. Cable systems networks using satellite links can be expected to develop.

Still Pictures With Sound

Still picture transmission. Present TV signals carry 30 still picture frames per second of video. For programming involving still pictures only, (such as educational uses, information retrieval, or facsimile distribution of printed matter), a single TV channel could transmit more than 100 series of still pictures with sound at the same time. Still picture transmission over cable could be used for a variety of

information instructional uses. The cost of a receiving device capable of storing the picture and displaying it for a long period of time is still high (more than $500/unit), but expected to come down to $100/unit or less in 5 years. "Electronic mail" and facsimile systems and services are expected to grow from $78 million/year to nearly $1 billion by 1980.

Hi-Fi TV

Flat wall screens and high resolution. Large (4 to 6 feet wide) flat (1-2 inches thick) wall screens are probably at least 10 years off. Coupled with higher resolution (more precise) pictures and aspect ratios (length/width) more like wide screen movies, a new "high fidelity" television service can be expected. This quality improvement can be considered analogous to the quality differential between stereo FM radio and traditional AM radio. Because higher resolution requires more bandwidth, it is expected that hi-fi TV will be delivered over cable rather than broadcast transmission.

Two-Way

Home terminals. A variety of functions can be performed by home terminals. Systems that will be marketed in the next five to ten years will probably consist of simple keyboard digital response, channel monitoring and pay TV capability, as well as other possible options such as a frame freeze and storage unit, a calculator and hard-copy printing capability. Terminals probably will be leased to subscribers. Because they are a key element in any two-way system, home terminals transform a cable system from a way of transmitting video to a home into a communications network with varied applications.

Tiny Glass Fiber instead of Wire

Optical fiber transmission systems. Transmission of video over optical fibers, small strands of glass the thickness of a human hair, are presently in the laboratory stage, but could find application in 10 to 20 years. Optical systems offer the promise of low cost and tremendous bandwidth capacity (as much as 100 channels/fiber), and probably will be used in communication systems within buildings. They might eventually replace copper cable as the medium for "wired" transmission. Because development is limited at this stage, prediction of future applications is somewhat speculative.

Millimeter Waves

Millimeter wave transmission. Developments in solid state electronics make possible an alternative to the "wired city." Placing small signal repeating boxes on utility or light poles, proponents claim that an area could be blanketed by a millimeter wave "urban umbrella" at a cost competitive with cable. Cable systems eventually may incorporate millimeter wave systems into the trunking portion of their networks.

A total of 36 categories of innovation were reviewed in the DRI study. Some of these will successfully enter the market, others won't. The

innovations discussed above are ones we believe have a good chance of success. They are presented to indicate the possibilities available in the future. It is not our intent to suggest waiting for their introduction, because new concepts will always continue to appear. The point is, that the form and function of telecommunications (cable included) will change over the years. With the large capital investment required, it is desirable to develop systems with the flexibility to incorporate innovations as they develop and prove desirable.

APPENDIX B

SUMMARY OF FEDERAL REGULATION

A TELEVISION DIGEST
WHITE PAPER

WEEKLY **Television Digest**
with **Consumer Electronics**

ORIGINATION CABLECASTIN

(1) REQUIREMENTS		(2) ORIGINATION CHANNELS	ACCESS CHANNELS (3) PUBLIC	ACCESS CHANNELS (4) EDUCATION
A. Number of Channels. General Top-100 market system must have: (i) at least 20 broadcast channels (76.251(a)(1)) (ii) including a origination or subscription channel for each off air channel (76.251(a)(2)), and (iii) non-voice return communication capacity (76.251(a)(3)).		Systems over 3,500 subscribers must: (a) have at least one origination channel (76.201(a)), (b) have non automated facilities for local production (76.201(a)), and (c) be local outlet "to a significant extent" (76.201(a)).	At least one dedicated channel (76.251 (a)(4)).	At least one dedicated channel (76.251(a)(5)).
B. Channel Use Charges.		Rates and practices for political advertising must be: (1) uniform and comparable to charges for other uses (76.205(b)(1)). (2) non discriminatory and non preferential (76.205(b)(2)).	One channel may only charge for use exceeding 5 minutes of live production facilities (76.251(a)(11)(ii)).	No charges for first 5 years (76.251(a)(10)(i)).
C. Special Use Requirements.	(1) Non Subscription Channels.	Origination channels usable for such purpose only (76.201(a)). Commerical advertising at beginning and end of program and in natural breaks not in control of system (76.217). Outside top-100 market system cannot restrict use of substantial portion of time (including prime) for controversial local issues (76.201(b)).	Non discriminatory, first come basis (76.251(11)(i)).	No provisions.
	(2) Subscription Channels. (per program or per channel charge)	Subscription TV permitted - See box below for requirements (76.5(w), 76.225)).	Subcription TV not prohibited. See box below for requirements. When an access channel in use 80% of Monday thru Friday for 80% of any consecutive 3 hours for 6 w	
		A. Series: Not permitted if interconnected plot or same cast of principal characters (76.225(a)(3)). B. Features: 1. Permitted only during 2 years after first U.S. general theatrical release (i.e., first run in a theater on a continuous performance, non reserv 2. One feature so released more than 10 years previously may have multiple showings during one week each month. 3. Waiver obtainable on restricted features if: (a) satisfactory arrangements for editing for free TV not achieved, (b) not saleable to free TV, or (c) are intended never to be available to free TV to protect theatrical re-release (76.225(a)(C. Sports: 1. No subscription telecast for 2 years of: (i) sports event telecast on regular basis live on Grade A signal (Note 1, 76.225(a)(2)) in syst (ii) a specific sports event telecast in community when it occurred (76.225(a)(2)). D. Sports and Features: Limited to 90% of cablecast programming hours on an annual basis and not more than 95% of such hours in a month (76.225(a) E. Advertising: No advertising on feature or sports program except: (i) before and after, and (ii) to advertise other subscription programs (76.225(a	
D. General.		Subject to: 1. Fairness doctrine (76.201(c), 76.209). 2. Sponsorship identification rules (76.201(c),76.221). 3. Political candidate cablecasts in addition: (a) are subject to equal time rules (76.201(c), 76.205(a)(1)-(4)). (b) require 2 year retention of records of candidate requests for origination time (76.205(c)).	No commercial or political candidate advertising (76.251(a)(11)(i)). Unused time must be available for leased access, subject to displacement for designated use of channel (76.251(a)(7)).	
			No censorship (76.251(a)(9)). 2 year retention of records of requests for access time (76.251(a)(11)(i)-(iii)). Operating rules and rates to be established and filed with FCC (76.251(a)(11)(iv)).	
		No lotteries (76.201(c), 76.213, 76.251(a)(11)(i)-(iii)). No obscene or indecent material (76.201(c), 76.215, 76.251(a)(11)(i)-(iii)). Systems outside any TV market may not be required by a local entity to exceed requirements for top-100 markets re channel availability and administrati but access channels on such systems subject to specified operating rule requirements (See 76.251(b) and 76.251(a)(9)-(11)).		
E. Grandfathering.		Systems in top-100 markets operating on March 31, 1972 grandfathered until March 31, 1977. If prior to March 31, 1977, access channel operations com conform to applicable requirements. System must add one access channel for each such added signal in following order of priority: public, educational, gov		

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References are to FCC Cable Television Report and Order adopted February 2, 1972, as amended

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onics

ORIGINATION CABLECASTING

Prepared by Herbert S. Stern, MCA Inc.

As of July 1, 1972

AUGUST 7, 1972
VOL. 12:32

ACCESS CHANNELS IN TOP-100 MARKETS

(3) PUBLIC	(4) EDUCATION	(5) LEASED	(6) GOVERNMENT
ne dedicated channel a)(4)).	At least one dedicated channel (76.251(a)(5)).	Dedicated channels optional (76.251(a)(7)). Priority to part time users required on at least one channel (76.251(a)(7)). Operable only if all other access channels requirements met (76.251(a)(7)).	At least one dedicated channel (76.251(a)(6)).
iel may only charge for use exceeding of live production facilities (11)(ii)).	No charges for first 5 years (76.251(a)(10)(i)).	No provisions.	No charges for first 5 years (76.251(a)(10)(i)).
minatory, first come basis 1)(i)).	No provisions.	Non discriminatory, first come basis (76.251(a)(11)(iii)).	No censorship (76.251(a)(9)). No restrictions, except as State or Federal laws may otherwise provide.

n TV not prohibited. See box below for requirements.

ccess channel in use 80% of Monday thru Friday for 80% of any consecutive 3 hours for 6 weeks, new channel required (76.251(a)(8)).

t of principal characters (76.225(a)(3)).

general theatrical release (i.e., first run in a theater on a continuous performance, non reserved seat basis (Note, 76.225(a)(1)).
eviously may have multiple showings during one week each month.
(a) satisfactory arrangements for editing for free TV not achieved,
(b) not saleable to free TV, or
(c) are intended never to be available to free Tv to protect theatrical re release (76.225(a)(1)).

sports event telecast on regular basis live on Grade A signal (Note 1, 76.225(a)(2)) in system community, or
a specific sports event telecast in community when it occurred (76.225(a)(2)).

ming hours on an annual basis and not more than 95% of such hours in a month (76.225(a)(4)).

xcept (i) before and after, and (ii) to advertise other subscription programs (76.225(a)(5)).

No censorship (76.251(a)(9)).

No restrictions, except as State or Federal laws may otherwise provide.

ercial or political candidate advertising (76.251(a)(11)(i)).	Commercial and political candidate advertising permitted (76.251(a)(11)(iii)). Sponsorship identification rules applicable (76.201(c), 76.221, 76.251(a)(11)(iii)). Not subject to non-disruptive advertising rules.
me must be available for leased access, subject to displacement for designated nnel (76.251(a)(7)).	

rship (76.251(a)(9)).

tention of records of requests for access time (76.251(a)(11)(i)-(iii)).

rules and rates to be established and filed with FCC (76.251(a)(11)(iv)).

(11)(i)-(iii)).

entity to exceed requirements for top-100 markets re channel availability and administration (76.251(b), 76.251(a)(11)(iv))
ng rule requirements (See 76.251(b) and 76.251(a)(9)-(11)).

ndfathered until March 31, 1977. If prior to March 31, 1977, access channel operations commence or if television signals are added to fill quota or as wild cards in top-100 market, operations shall
ss channel for each such added signal in following order of priority: public, educational, government, leased (76.251(c)).

nces are to FCC Cable Television Report and Order adopted February 2, 1972, as amended June 12, 1972

BROADCAST SIGNAL USE BY CABLE S

	(1) SYSTEMS IN MARKETS 1–50 (76.51 (a))	(2) SYSTEMS IN MARKETS 51–100 (76.51 (b))	(3) SYSTEMS IN SMALLER MARKETS (76
A. Local Signals – Must Carry on Request	Stations within 35 miles; hyphenate market stations; significantly viewed stations; Grade B ETV's; and translators serving system community if (a) 100+watt, and (b) for systems starting or adding channels after 3/31/72, 5+watt non-commercial educational translators (76.61(a)(1)–(5)); except overlapping top-100 signal barred unless system wholly within 35 miles of overlapping station (76.61(a)(1)).		Stations within 35 miles; same market statio significantly viewed stations; Grade B statio in other Smaller Markets; Grade B ETV's; an translators serving system community if (a) 100+watt, and (b) for systems starting or adding channels after 3/31/72, 5+watt no commerical educational translators (76.59(a)(1)–(6)).
B. Distant Signals – May Carry – (Subject to Leapfrogging Restrictions)	Sufficient to fill quota of 3 networks, 3 independents (76.61(b)).	Sufficient to fill quota of 3 networks, 2 independents (76.63(a)).	Sufficient to fill quota of 3 networks, 1 independent (76.59(b)). Plus: (i) state agency ETV's (76.59(c)); (ii) foreign language stations (76.59(d)(1)); (iii) a network program which will not be carried by a station normally carried by the system (76.59(d)(2)).
	Plus: (i) 2 independent signals ("Wild Cards") less network and independent stations added to fill quota (76.61(c)); (ii) state agency ETV's (76.61(d)); and (iii) foreign language stations (76.61(e) (1)); (iv) a network program which will not be carried by a station normally carried by the system (76.61(e)(2)). (re 51–100, ref. is 76.63(a) for (i) (ii) (iii) and (iv)). Program Substitution: A cable system may substitute, subject to the exclusivity rules, any other station's program for a program deleted from an independent signal if deletion was (i) due to exclusivity requirements or (ii) of a program primarily of local interest to the distant community (76.61(b)(2)(ii)).		
C. Leapfrogging Restrictions	Distant Network Signals: Obligatory priority to closest, or closest-in-state, network station (76.59(b)(1); 76.61(b)(1)). Distant Independent Signals (except ETV and foreign language): Obligatory priority: – May take from anywhere but if from a top–25 Market, first 2 must be from one or both of the 2 closest such markets (76.51(b)(2)); 76.61 (b) (2)). Imported third independent must be UHF within 200 miles, or, if none, either VHF independent within 200 miles or any independent UHF (76.61 (b) (2)).		
D. Non–duplication	Network Programming: On notice, a cable system in a station's Grade B zone or community of its 100+ watt translator may not simultaneously duplicate network programming by a lower priority (See Remarks) station signal (76.91(a); 76.93(b)(i)). Cable/station agreement on network exclusivity will be respected (76.95(b)). Cable system need not delete color signal in favor of black/white signal (76.95(a)).		
		Special relief for time-zone problems: – Network station in Mountain Standard Time Zone may prohi program (76.93(b)) except no deletion required (i) if would reduce cable system's network signals bel time network program is not broadcast by the requesting station in prime time in its time zone (76.9	
E. Exclusivity	Network Program: See non-duplication. Syndicated Program: Protected against distant signals during (a) pre-clearance 1 year from first U.S. syndicated sale of all new (Report 105) series (76.151(a)); and (b) run-of-contract in market (76.151(b)). Episodes in different series packages are protected while any episode is protected (76.151 (b)(6)(i)).	Network Program: See non-duplication. Syndicated Program: Protected against distant signals as follows unless cable system carries in prime time and market station does not (76.151(b)(1)): (a) Off-network series: (i) no pre-clearance (76.151(b)(2)(i)). (ii) from first non-network broadcast in the market of an episode until earlier of 1 year or completion of run (76.151 (b)(2)(ii)). (b) First-run series: (i) no pre-clearance (76.151 (b)(3)(i)). (ii) for 2 years from first non-network broadcast of an episode (76.151(b)(3)(ii)). (c) Feature or First-run Non-series: (i) no pre-clearance (76.151(b)(5)(i),(4)(i). (ii) for 2 years from availability under a license for the market (76.151(b)(5)(ii),(4)(ii)). (d) Other programs: (i) no pre-clearance (ii) until earlier of 1 year from purchase for non-network broadcast in the market or day after such broadcast (76.151(b)(6)). Episodes in different series packages are not protected after initial exclusivity period (76.151(b)(6)(ii)).	Network Program: See non-duplication. Syndicated Program: No protection.
F. Grandfathering	Stations's non-network program exclusivity rights on March 30, 1972 continue as to simultaneous duplication by a lower priority station signal unless entit exclusivity (76.99). Systems operating as of March 31, 1972 are grandfathered as to then existing signals and as to discrete areas, if any to which limited b systems may carry same signals (76.65). Such grandfathered signals need not comply with exclusivity requirements (76.159). Grandfathered systems requir (i) if new signals added, or service area extended beyond existing franchise and (ii) in any event, by earlier of end of franchise or March 31, 1977 (76.11(b		
G. Notices re Exclusivity	(a) Syndicated program pre-clearance – notice by copyright holder (76.153(a)(c) and 76.155)). (b) Other – by television station (76.153(b)).	By television station (76.153(b)).	By television station (76.153(b)).

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References are to the FCC Cable Television Report and Order adopted February 2, 1972, as

ROADCAST SIGNAL USE BY CABLE SYSTEMS

N MARKETS 51–100 (76.51 (b))	(3) SYSTEMS IN SMALLER MARKETS (76.5)	(4) SYSTEMS OUTSIDE TV MARKET (76.57)	(5) REMARKS
d stations; Grade B ETV's; and ms starting or adding channels)(1)–(5)); except overlapping ng station (76.61(a)(1)).	Stations within 35 miles; same market stations; significantly viewed stations; Grade B stations in other Smaller Markets; Grade B ETV's; and translators serving system community if (a) 100+watt, and (b) for systems starting or adding channels after 3/31/72, 5+watt non-commerical educational translators (76.59(a)(1)–(6)).	Grade B; significantly viewed stations; ETV's within 35 miles; and translators serving system community if (a) 100+watt, and (b) for systems starting or adding channels after 3/31/72, 5+watt non-commerical educational translators (76.57(a)(1)–(4)).	System in overlapping markets deemed in larger market (76.59(e)). Cable facilities serving a distinct community is a "system" even though the head end serves more than one "system" (Note 76.5(a)).
ll quota of 3 networks, 2 (76.63(a)).	Sufficient to fill quota of 3 networks, 1 independent (76.59(b)). Plus: (i) state agency ETV's (76.59(c)); (ii) foreign language stations (76.59(d)(1)); (iii) a network program which will not be carried by a station normally carried by the system (76.59(d)(2)).	Any number (76.57(b)).	"Significantly viewed" requires for (a) full or partial network station: (i) 3% share of total week viewing hours (i.e., a share equals the no. hours non-TV cable homes viewed subject station stated as a % of the no. hours such homes viewed all stations) and (ii) 25% net weekly circulation (i.e., a share equals the no. non-cable TV homes viewing subject station for 5+ minutes stated as a % of the no. non-cable TV homes). (b) independent station: (i) 2% share of total week viewing hours and (ii) 5% net weekly circulation (76.5(k)). (Listed by counties in Appendix "B").
dent stations added to fill quota Stations (76.61(e) (1)); (iv) a by the system (76.61(e)(2)).			
lusivity rules, any other station's as (i) due to exclusivity require-nunity (76.61(b)(2)(ii)).			
te, network station (76.59(b)(1); 76.61(b)(1)).		None	
ory priority: – May take from anywhere but if from a top–25 Market, first ; 76.61 (b) (2)). Imported third independent must be UHF within 200 pendent UHF (76.61 (b) (2)).			
zone or community of its 100+ watt translator may not simultaneously on signal (76.91(a); 76.93(b)(i)).		Network Programming: On notice, no simultaneous duplication of significantly viewed Smaller Market station unless grandfathered (76.91(c)).	Order of signal priority is (1) City Grade, (2) Grade A, (3) Grade B, and (4) 100+watt translators in system community (76.91(b)(1)–(4)).
5(b)). Cable system need not delete color signal in favor of black/white			
or time-zone problems: – Network station in Mountain Standard Time Zone may prohibit same day duplication of any network 3(b)) except no deletion required (i) if would reduce cable system's network signals below 2 (76.93 (b) (1)), or (ii) if a prime program is not broadcast by the requesting station in prime time in its time zone (76.93 (b) (2)).			
am: See non-duplication. gram: Protected against distant vs unless cable system carries nd market station does not series: (i) no pre-clearance)). (ii) from first non-network e market of an episode until or completion of run (76.151 ries: (i) no pre-clearance (76.151 or 2 years from first non-network episode (76.151(b)(3)(ii)). First-run Non-series: (i) no pre-51(b)(5)(i),(4)(i). (ii) for 2 years y under a license for the market i),(4)(ii)). ams: (i) no pre-clearance (ii) 1 year from purchase for non-cast in the market or day after (76.151(b)(6)). ferent series packages are not initial exclusivity period i)).	Network Program: See non-duplication. Syndicated Program: No protection.	Network Program: See non-duplication. Syndicated Program: No protection.	Exclusivity available only if contracts as a minimum provide for air and cable exclusivity against same community stations and distant signals on cable systems within 35 mile zone. Broader exclusivity permitted, and if includes other communities in same market, will protect within 35 miles of such communities (e.g.: Dallas–Ft. Worth). (76.153(c)). Exclusivity is presumed within 35 miles from all stations in the market in which a station is located over broadcast rights acquired prior to March 31, 1972 (76.153(c)). Prime time: 6–11:00 p.m. (76.5(u)). "Stations" includes foreign stations which may not claim carriage or program exclusivity but may be carried subject to the Rules (76.5(b)).
ontinue as to simultaneous duplication by a lower priority station signal unless entitled to special time zone same day athered as to then existing signals and as to discrete areas, if any to which limited by FCC. Other same community d not comply with exclusivity requirements (76.159). Grandfathered systems require FCC Certificate of Compliance hise and (ii) in any event, by earlier of end of franchise or March 31, 1977 (76.11(b)).			
ation (76.153(b)).	By television station (76.153(b)).	By television station (76.91(c)).	

es are to the FCC Cable Television Report and Order adopted February 2, 1972, as amended June 12, 1972

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APPENDIX C

SELECTED BIBLIOGRAPHY

SELECTED BIBLIOGRAPHY

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APPENDIX D

STATUS OF CABLE DEVELOPMENT IN METRO DENVER

STATUS OF CABLE DEVELOPMENT IN METRO DENVER

A summary of the current status of cable development in metro Denver is presented in Table D-1. Information was compiled from questionnaires completed and submitted by the jurisdictions involved and by Cablecom-General. Mountain States Video (51% owned by Cablecom-General, 49% owned by Mountain States Video, Inc.) currently holds fifteen franchises or permits in the area.* Longmont Video, Inc., with similar ownership, has two franchises. Community Tele-Communications, Inc., (CTCI), part of Tele-Communications, Inc. has a franchise in Boulder and is serving part of the city, but Boulder is seeking a new franchise.

Lakewood and Boulder currently are reviewing applicants' bids for new franchises. Mountain States Video and CTCI are bidding for the Lakewood franchise. Teleprompter and CTCI are bidding for the Boulder franchise.

Some other jurisdictions (Arvada, Boulder County, Englewood) are reviewing current franchises to see whether or not to seek new ones. Arvada and Englewood franchises are held by Mountain States Video; Boulder County's franchise is held by Longmont Video, Inc.

Denver, Littleton (which had a franchise that expired), Northglenn, Thornton, Wheat Ridge, and Adams and Arapahoe Counties are large jurisdictions with no franchises and no immediate plans to grant any.

In the other towns in the five county area to which questionnaires were mailed (Lyons, Nederland, Ward) there are no cable franchises and none are contemplated in the near future. Towns not surveyed were Bennett, Columbine Valley, Deer Trail, Evergreen, Jamestown, Morrison, Mountain View, and Lakeside. We are not aware of any franchises in those towns.

Considering Cable-com General's majority control of Mountain States Video (MSV), all current franchises and applicants are multiple systems operators ranking among the top ten in the country. This is representative of the changing structure of the cable industry, moving from a business comprised of small independent systems to a business with relatively few large operators. The top 25 cable companies serve 59% of total homes receiving cable service in the U.S.

Boulder and Lakewood are seeking franchises more specific and more oriented to the potential public service aspects of cable than present franchises. Applications for certificates of compliance have been filed on almost all current franchises and these applications state that the systems will meet all FCC requirements. The Boulder and Lakewood franchises will exceed minimums in many respects and will reflect the significant change in the view of cable potential that has occurred in the last year or two.

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*The term franchise is used in this report for both franchises and permits.

TABLE D-1

STATUS OF CABLE DEVELOPMENT IN METRO DENVER – JANUARY 1973[1]

City	Original Franchise Granted	Company	Terms	Fees[2]	Timetable in Franchise[3]	Comments: Responsibility for Monitoring Cable TV Development
Arvada	1968	MSV	Non-exclusive, revocable at will.	$4.75/mo. subscriber fee; 5% of gross revenues as fee to city.	Start construction within 60 days of FCC approvals, substantial completion of microwave facilities and city approval of construction plans, or within 5 years of effective date of ordinance, whichever comes first.	Objection filed to immediate granting of certificate of compliance. Responsibility for monitoring: City Council.
Aurora	1968	MSV	Non-exclusive, revocable for cause.	$4.75/mo., 5% fee	Start construction 60 days after FCC and other necessary government approvals.	Responsibility: City Manager and staff.
Boulder	1964 Applicants for new franchise being reviewed.	CTCI	Non-exclusive, revocable at will.	$5.95/mo., 2% fee	Three years from effective date of franchise to commence operations (1964 franchise).	Service initially provided to one part of Boulder in 1965. Boulder currently drafting new ordinance and seeking new franchise. Objection filed to CTCI application for certificate of compliance. Responsibility: City Manager and staff.
Bow Mar	None	N.A.	N.A.	N.A.	N.R.	N.R.
Brighton	1968	MSV	Non-exclusive, revocable at will.	$4.75/mo., fee not stated.	Start construction 180 days after FCC approval, substantial completion of microwave facilities, and city approval of plans.	City manager or his staff.
Broomfield	1971	MSV	Non-exclusive, revocable at will, 20 yr. term.	$4.75/mo., 5% fee	Start construction promptly after FCC and other necessary government approvals.	N.R.
Cherry Hills Village	none	N.A.	N.A.	N.A.	Have not considered yet.	Responsibility: City Attorney and Mayor.
Commerce City	1968	MSV	Non-exclusive, revocable at will.	$4.75/mo., 5% fee	Start construction 60 days after FCC approval, substantial completion of microwave facilities, and city approval of plans.	Responsibility: City Manager and staff.

[1] Table based on information submitted by the jurisdictions involved and by Cable-com General.
[2] Most fees are subject to revision to comply with FCC rules on fees to city (a suggested maximum 3 to 5% of gross subscriber revenues) and to reflect the expanded system capacity by FCC.
[3] FCC rules now call for "significant construction within one year after receiving Commission certification."

Abbreviations:
CTCI Community Tele-Communications, Inc.
LVI Longmont Video, Inc.
MSV Mountain States Video
N.A. not applicable
N.R. no reply

TABLE D-1 (CONT.)

STATUS OF CABLE DEVELOPMENT IN METRO DENVER – JANUARY 1973[1] (CONT.)

City	Original Franchise Granted	Company	Terms	Fees[2]	Timetable in Franchise[3]	Comments: Responsibility for Monitoring Cable TV Development
Denver	none	N.A.	N.A.	N.A.	N.A.	Responsibility: City Council Committee
Edgewater	1967	MSV	Non-exclusive, revocable at will.	Subscriber fee not specified; 4% fee to city.	Start construction 3 months after FCC approval, substantial completion of microwave facilities, and city approval of plans.	N.R.
Englewood	1967	MSV	Non-exclusive, revocable at will, 20 yr. term.	$4.75/mo., 5% fee	Start construction promptly after FCC and other necessary government approvals.	Objection filed to immediate granting of certificate of compliance. Responsibility: City Manager and staff.
Federal Heights	1970	MSV	Non-exclusive, revocable at will, 20 yr. term.	$4.75/mo., 5% fee	Start construction promptly after FCC and other necessary government approvals.	Responsibility: City Council.
Glendale	none	N.A.	N.A.	N.A.	N.R.	Responsibility: City Manager and staff.
Golden	1967	MSV	Non-exclusive, revocable for cause, 15 yr. term.	Subscriber fee not specified; 4% fee to city.	Start construction promptly after FCC approval, substantial completion of microwave facilities, and city approval of plans.	Responsibility: City Council.
Greenwood Village	1968	MSV	Non-exclusive, revocable at will, 20 yr. term.	$4.75/mo., 5% fee	Start construction promptly after FCC and other necessary government approvals.	Responsibility: N.R.
Lafayette	1970	MSV	Non-exclusive, revocable at will, 20 yr. term.	$4.75/mo., 5% fee	Start construction promptly after FCC and other necessary government approvals.	Responsibility: City Manager and City Council.
Lakewood	None. Applicants now being reviewed. Ordinance enacted in 1972.	–	Non-exclusive, revocable for cause.	Not yet determined.	Construction complete in Green Mountain area one year after FCC approval; total system completed within 5 yrs. of FCC approval.	Responsibility: City Manager and appointed Cable Communications Commission.
Littleton	1967 now expired	N.A.	N.A.	N.A.	Plan to introduce an ordinance within 1 year.	Responsibility: City Manager and staff.

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TABLE D-1 (CONT.)
STATUS OF CABLE DEVELOPMENT IN METRO DENVER – JANUARY 1973[1] (CONT.)

City	Original Franchise Granted	Company	Terms	Fees[2]	Timetable in Franchise[3]	Comments: Responsibility for Monitoring Cable TV Development
Longmont	1967	LVI	Non-exclusive, revocable at will.	N.R.	Start construction within 1 year of FCC approval.	New certificate of compliance not yet filed. Some question as to whether franchise is still valid. Responsibility: City Manager and City Council.
Louisville	1971	MSV	Non-exclusive, revocable at will, 20 yr. term.	$4.75/mo., fee to city not stated.	Start construction promptly after FCC and other necessary government approvals.	N.R.
Northglenn	None	N.A.	N.A.	N.A.	Plan to introduce an ordinance in 1 to 2 years.	Responsibility: City Manager.
Sheridan	1967	MSV	Non-exclusive, revocable at will.	Subscriber fee not specified; 4% fee to city.	Start construction promptly after FCC approval, substantial completion of microwave facilities, and city approval of plans.	Responsibility: Mayor and City Council.
Thornton	None	N.A.	N.A.	N.A.	May introduce an ordinance within the next 1 to 2 years.	N.R.
Wheat Ridge	None	N.A.	N.A.	N.A.	N.R.	Responsibility: not assigned.
Westminister	1970	MSV	Non-exclusive, revocable at will, 20 yr. term.	$4.75/mo., 5% fee	Start construction promptly after FCC and other necessary government approvals.	Responsibility: City Manager and City Council.
County						
Adams	None	N.A.	N.A.	N.A.	Plans indefinite	Responsibility: County staff.
Arapahoe	None	N.A.	N.A.	N.A.	Plans indefinite	Responsibility: not assigned.

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N.R. no reply

TABLE D-1 (CONT.)

STATUS OF CABLE DEVELOPMENT IN METRO DENVER – JANUARY 1973[1] (CONT.)

County	Original Franchise Granted	Company	Terms	Fees[2]	Timetable in Franchise[3]	Comments: Responsibility for Monitoring
Boulder	1968	LVI	For the areas surrounding Longmont, Lafayette and Louisville only; non-exclusive, revocable; 15 yr. term.	Subscriber fee not specified; sliding scale fee to county starting at 5% and increasing to 10% as a function of revenues.	Start construction promptly after FCC approval, substantial completion of microwave facilities, and county approval of plans.	Franchise being reconsidered by County. Responsibility: Temporarily, Director, Boulder County Cable Communications Project.
Jefferson	N.R.	MSV	Non-exclusive, revocable; 15 yr. term.	Subscriber fee not stated; 4% fee to county.	Start construction promptly after FCC approval.	N.R.

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Blanket objections to MSV's applications for certificates of compliance have been filed by Spanish International, which objects to importation of XEJ, Juarez and by KRDO, Colorado Springs, which believes it should be carried on Denver area cable systems.

Mountain States Video has said that it will interconnect its systems in the metro area. However, just what channels will be interconnected, and questions of interconnection with systems owned by other companies are undefined. Most present franchises say nothing about interconnection.

Public hearings and other forms of citizen involvement such as cable committees have been limited. Public hearings typically have been routine readings of proposed ordinances and franchises. Lakewood's Citizens Advisory Committee on CATV has been the major instance of opening up cable policy issues to public discussion. Boulder also has had significant public discussion of cable development alternatives.

Our survey results indicate that generally there is some community interest in cable but it is limited to a few individuals or groups. There is little public demand for more involvement in cable decision-making. Most organized community interest in cable in centered among the Chicano and Black minorities in Denver.

Respondents (generally city managers or someone on their staff) were provided a list of cable TV issues and were asked which were of most concern to them. Of the 25 who answered that question, the number checking each issue was:

20–Franchise terms and conditions

6–Public versus private ownership

4–Racial minority group ownership, access and/or control

18–Provision of channels for local government use

11–Federal-state local jurisdiction problems

13–Regional interconnection of systems to allow shared programming in metro Denver

14–Public access to cable channels

5–Regulatory issues such as whether cable should be considered a common carrier

15–Fee return to the city (county) from cable revenues

19–Cable cost to the consumer

Other:

1–Problem of defining the area to be covered by county permits.

Several respondents emphasized that all issues were of some concern to them and that only the issues they viewed as highest priority were checked.

Time for start of cable operations in the Denver area is uncertain. Most franchises called for start of construction "forthwith" or "promptly" after receipt of FCC and other government approvals. In some cases "substantial completion" of microwave

facilities for importing distant signals was required. However, FCC rules now call for "significant construction within one year after receiving Commission certification." From our interviews with cable company executives, it appears that construction of cable systems in the suburban metro area will begin and accelerate over the next two to three years.